REMARKS

Status of the Claims

Claims 1-9 and 12-19 are pending in this application.

Claims 1-9 and 12-19 are rejected.

Rejection of Claims 1-4, 9, 12, and 15-19 Under 35 U.S.C. § 102(b)

Claims 1-4, 9, 12, and 15-19 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Publication No. 2002/0032510 to Turnbull (hereafter "Turnbull '510"). The Applicant respectfully traverses the 35 U.S.C. § 102(b) rejection of claims 1-4, 9, 12, and 15-19. Applicant respectfully requests reconsideration of the rejection based on the following remarks.

The law is clear that anticipation requires that a single prior art reference disclose each and every limitation of the claim sought to be rejected. The law is also clear that a claim in dependent form shall be construed to incorporate all the limitations of the claim to which it refers.

The Office Action asserts that Turnbull '510 does disclose a speaker housing in Figures 17-18, an acoustic port 506, and the two speakers (500,510). The Office Action also states that Turnbull '510 also discloses that the sound from the speaker (500) exits the acoustic port (506), which is 180 degrees out of phase with the sound generated from the speaker (500), and the sound from speaker (500) is inherently from the rear of the speaker diaphragm. Also, the Office Action states that the "sound port (506) rents the outside of the mirror housing and constructs a last bass reflex system," in paragraphs [0222]-[0225] in Turnbull '510.

Applicant respectfully disagrees that Turnbull '510 discloses the element of a mirror housing in which at least one speaker is arranged, said speaker being part of a **bass reflex system**. The acoustic port 506 of Turnbull '510 is not a bass reflex system. The specification of the present application specifically states that the bass reflex system includes a chamber 16, at least one speaker 17,18, and a bass reflex port 24. *See Paragraph [0026] of Present Application.* Turnbull '510 only shows an acoustic port 506. The port is just one portion of a bass reflex system as claimed and stated in the specification of the present application. Additionally, in a bass reflex system, the rear side of the diaphragm of the speaker is the source of the sound which is emitted from a port. *See the previously submitted attached excerpt from http://en.wikipedia.org/wiki/Bass_reflex.* Turnbull '510 makes no mention of the source of the sound emanating from the acoustic port 506 being from the rear side of a diaphragm. The acoustic port of Turnbull '510 does not anticipate the claimed bass reflex system of the present application. Removal of the rejection of claim 1 and dependent claims 2-9 and 12-19 is respectfully requested.

Applicant further maintains that the very nature of using the bass reflex system is to use a port to increase the efficiency of the system at low frequencies as compared to a typically closed box loud speaker. *See the previously submitted attached excerpt from http://en.wikipedia.org/wiki/Bass_reflex.* The acoustic port 506 set forth in Turnbull '510 is open towards the windshield so as to project sound towards the windshield such that it may be reflected towards the driver's ears, and away from the microphone 508. *Paragraph [0222].* The acoustic port 506 of Turnbull '510 does not increase the efficiency of a system at low frequencies, which is the function of the port in a bass reflex system.

Applicant also asserts it is further shown that Turnbull '510 does not disclose a bass reflex system because Turnbull '510 indicates that the acoustic port 506 can be replaced with a second speaker to achieve the same or better results than the acoustic port. *Paragraph [0223].* Thus, the acoustic port is not being used for low frequencies, which are characteristic of a bass reflex system. Instead, the acoustic port is used for high and low frequencies which are both typical of a speaker. Therefore, Turnbull '510 does not disclose a bass reflex system.

Turnbull '510 also specifically states that the speaker is positioned so as to generate sound toward the vehicle windshield such that the **higher frequency** sound is reflected towards the driver's ears. *Paragraph [0222] (Emphasis Added).* The very nature of using a bass reflex system is to use a port to increase the efficiency of the system at **low frequencies** as compared to a typically closed box loud speaker. *See the previously submitted attached excerpt from http://en.wikipedia.org/wiki/Bass_reflex.* The acoustic port 506 set forth in Turnbull '510 is open towards the windshield so as to project sound towards the windshield such that it may be reflected towards the driver's ears, and away from the microphone 508. *Paragraph [0222].* This also nulls the sound at lower wavelengths (e.g. higher frequencies) to eliminate interference with the microphone. *Id.* Clearly the acoustic port 506 is being used to project sound away or minimize sound at the microphone 508, and not to increase the efficiency of the system at low frequencies, which is the function of a bass reflex system.

In view of the foregoing, the Applicant respectfully submits that claim 1 defines over the art cited by the Examiner and respectfully requests withdrawal of the rejection. Likewise, claims 2-4, 9, 12, and 15-19, which depend either directly or indirectly from claim 1, further define the invention and define over the art cited by the Examiner. Thus, Applicant respectfully requests withdrawal of the rejection.

Rejection of Claims 5-8, 13, and 14 Under 35 U.S.C. § 103

Claims 5-8 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Turnbull '510 in view of U.S. Patent No. 6,127,919 to Wylin (hereafter "Wylin '919"). Applicant respectfully traverses the 35 U.S.C. § 103(a) rejection of claims 5-8.

Establishing a *prima facie* case of obviousness requires that the proposed combination of references teach or render obvious **all** the elements of the rejected claims. Applicant maintains that the combination of Turnbull '510 in view of Wylin '919 fails to teach or render obvious all the elements of the rejected claims because the proposed combination of Turnbull '510 in view of Wylin '919 fails to teach or render obvious a bass reflex system as set forth in rejected claim 1, from which claims 5-8 depend.

The Office Action asserts that Turnbull '510 teaches a speaker housing in Figures 17-18, an acoustic port 506, and the two speakers (500,510). The Office Action also states that Turnbull '510 also teaches that the sound from the speaker (500) exits the acoustic port (506), which is 180 degrees out of phase with the sound generated from the speaker (500), and the sound from speaker (500) is inherently from the rear of the speaker diaphragm. Also, the Office Action states that "the sound port (506) rents the outside of the mirror housing and constructs a last bass reflex system in paragraphs [0222]-[0225]," of Turnbull '510.

Applicant respectfully disagrees that Turnbull '510 teaches the element of a mirror housing in which at least one speaker is arranged, said speaker being part of a **bass reflex system**. The acoustic port 506 of Turnbull '510 is not a bass reflex system. The specification of the present application specifically states that the bass reflex system includes a chamber 16, at least one speaker 17,18, and a bass reflex port 24. *See Paragraph [0026] of Present Application.* Turnbull '510 only shows an acoustic port

506. The port is just one portion of a bass reflex system as claimed and stated in the specification of the present application. Additionally, in a bass reflex system, the rear side of the diaphragm of the speaker is the source of the sound which is emitted from a port. *See the previously submitted attached excerpt from http://en.wikipedia.org/wiki/Bass_reflex.* Turnbull '510 makes no mention of the source of the sound emanating from the acoustic port 506 being from the rear side of a diaphragm. The acoustic port of Turnbull '510 does not teach the claimed bass reflex system of the present application.

Applicant further maintains that the very nature of using a bass reflex system is to use a port to increase the efficiency of the system at low frequencies as compared to a typically closed box loud speaker. *See the previously submitted attached excerpt from http://en.wikipedia.org/wiki/Bass_reflex.* The acoustic port 506 set forth in Turnbull '510 is open towards the windshield so as to project sound towards the windshield such that it may be reflected towards the driver's ears, and away from the microphone 508. *Paragraph [0222].* The acoustic port 506 of Turnbull '510 does not increase the efficiency of a system at low frequencies, which is the function of the port in a bass reflex system.

Applicant also asserts it is further shown that Turnbull '510 does not teach a bass reflex system because Turnbull '510 indicates that the acoustic port 506 can be replaced with a second speaker to achieve the same or better results than the acoustic port. *Paragraph [0223].* Thus, the acoustic port is not being used for low frequencies, which are characteristic of a bass reflex system. Instead, the acoustic port is used for high and low frequencies which are both typical of a speaker. Therefore, Turnbull '510 does not disclose a bass reflex system.

Turnbull '510 also specifically states that the speaker is positioned so as to generate sound toward the vehicle windshield such that the **higher frequency** sound is reflected towards the driver's ears. *Paragraph [0222] (Emphasis Added).* Turnbull '510 specifically states that the port 106 preferably opens towards the windshield so as to project sounds towards the windshield such that it may be reflected towards the driver's ears and away from microphone 508. *Paragraph [0222].* The idea behind using a bass reflex system is to use a port to increase the efficiency of the system at **low frequencies** as compared to a typically closed box loud speaker. *See the previously submitted attached excerpt from http://en.wikipedia.org/wiki/Bass_reflex.* Turnbull '510 states that the port 506 is used to project sound towards the windshield to reflect the sound towards the driver's ears. However, it is also stated in Turnbull '510 that the higher frequency sound is reflected towards the driver's ears off the windshield, not low frequency level sound. Additionally, Turnbull '510 also teaches that because the sound exiting acoustic port 506 is 180 degrees out of phase with the sound generated from the speaker 500, the sound levels to which microphone 508 is exposed would be nulled at certain **lower wavelengths**. *Paragraph [0222] (Emphasis Added).* This shows that the acoustic port 506 of Turnbull '510 is used for reducing lower wavelength (e.g. higher frequency) sounds, not increasing the efficiency of lower frequency sound, which is the purpose of a bass reflex system. Thus, the specification of Turnbull '510 teaches that the function of the acoustic port is for directing sound off the windshield away from the microphone towards the driver's ears, and to reduce certain sounds which occur at lower wavelengths. Clearly, Turnbull '510 does not teach or render obvious a bass reflex system. Therefore, Wylin '919 must make up for these deficiencies, or the rejection will fall.

Even when combined with Turnbull '510, Wylin '919 does not teach or render obvious a bass reflex system. Wylin '919 teaches or renders obvious a speaker device 10 is shown in FIGS. 1, 2, and 3 to include a rigid body portion 30, an articulated arm 32, a full-size mirror 34, and first and second audio speakers 36 and 38, respectively. *Col. 2, Lines 48-51.* Wylin '919 also teaches that sound waves 120 emanating from first and second audio speakers 36 and 38, reflect off windshield 90 and back towards the vehicle occupants. *Col. 3, Lines 52-55.* Wylin '919 also teaches that as sound waves 120 emit back from windshield 90, they will be approximately positioned at the ear-level of the vehicle occupants. *Col. 3, Lines 55-57.* By definition, a bass reflex system requires a port of some sort. There is no port mentioned in Wylin '919, therefore Wylin '919 does not teach or render obvious a bass reflex system. Because Wylin '919 does not teach or render obvious a bass reflex system, and the port of Turnbull '510 is used for reducing certain types of sounds, consequently, Turnbull '510 in view of Wylin '919 cannot be combined to render the present invention obvious. Furthermore, Wylin '919 does not teach a port which emanates sound from the back side of the speaker diaphragm.

Claims 13 and 14 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Turnbull '510 in view of U.S. Patent No. 4,871,953 to Anstee (hereafter "Anstee '953"). The Applicant respectfully traverses the 35 U.S.C. § 103(a) rejection of claims 13 and 14.

Claims 13-14 are dependent claims which are either directly or indirectly dependent upon independent claim 1. As previously mentioned, claim 1 includes the elements of a mirror housing in which at least one speaker is arranged, said speaker being part of a bass reflex system. It has already been shown that these elements are not taught or rendered obvious by Turnbull '510. Therefore, Anstee '953 must be

combinable with Turnbull '510 to render the present invention obvious, or the rejection will fall.

Anstee '953 teaches a housing 10 of the left hand door mirror encloses two electric motors 12 and 14 arranged to vary the orientation of the reflected member (not shown) about horizontal and vertical axis, respectively. *Col. 1, Lines 62-66.* Each of the motors 12 and 14 is also coupled to drive a respective potentiometer 16, 18 which is arranged to provide an analog voltage indicating the orientation of the reflective member about the corresponding axis. *Col. 1, Line 66 - Col. 2, Line 2.* Anstee '953 teaches two potentiometers which change the orientation of a mirror in a mirror housing. Anstee '953 does not teach speakers in any form, let alone speakers used in a rearview mirror which are part of a bass reflex system. Therefore, Turnbull '510 in view of Anstee '953 does not render obvious the elements of a mirror housing in which at least one speaker is arranged, said speaker being part of a bass reflex system, as set forth in claim 1 of the present invention.

In view of the foregoing, the Applicant respectfully submits that claim 1 defines over the art cited by the Examiner and respectfully requests withdrawal of the rejection. Likewise, claims 13-14, which depend either directly or indirectly from claim 1, further define the invention and define over the art cited by the Examiner. Thus, Applicant respectfully requests withdrawal of the rejection.

CONCLUSION

It is respectfully submitted that in view of the above amendments and remarks the claims 1-9 and 12-19, as presented, are patentably distinguishable because the cited patents, whether taken alone or in combination, do not teach, suggest or render obvious, the present invention. Therefore, Applicant submits that the pending claims are properly allowable, which allowance is respectfully requested.

The Examiner is invited to telephone the Applicant's undersigned attorney at (248) 364-4300 if any unresolved matters remain.

Respectfully submitted,

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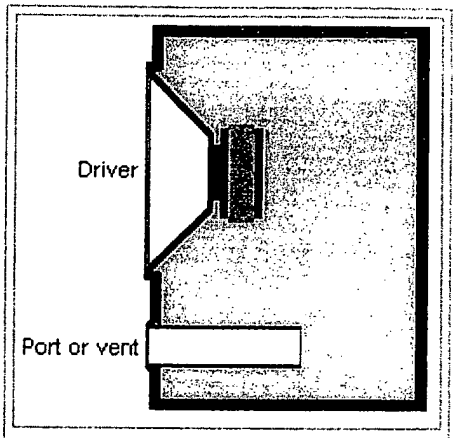
Bass reflex

From Wikipedia, the free encyclopedia

A **Bass reflex** system (also known as a **ported, vented box** or reflex port) is a type of loudspeaker enclosure that uses the sound from the rear side of the diaphragm to increase the efficiency of the system at low frequencies as compared to a typical closed box loudspeaker or an infinite baffle mounting.



Bass reflex enclosure schematic (cross-section).

Contents

Explanation

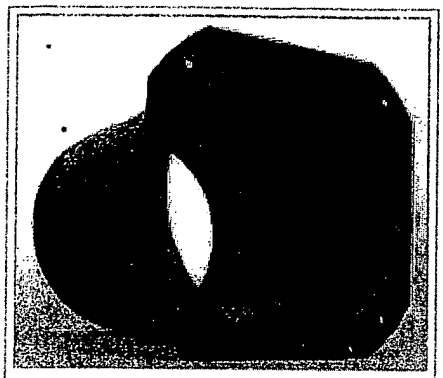
In contrast to closed box loudspeakers, which are substantially air tight, a bass reflex system has an opening called a *port* or *vent* which consists of an opening, generally backed with a pipe or duct of circular or rectangular cross section. The air mass in this opening resonates with the "springyness" of the air inside the enclosure in exactly the same fashion as the air in a bottle resonates when a current of air is directed across the opening. The frequency at which the box/port system resonates, known as the Helmholtz resonance, is determined by the cross sectional area and length of the duct and the volume of air inside the enclosure.

When all features are compared, for home use the advantages tend to outweigh the disadvantages because they allow more bass extension out of a smaller box. The design is so popular among consumers and manufacturers but the increase in bass output is invariably achieved at the expense of temporal integrity of the signal and the buildup of more resonances. Reflex designs can be undesirable in settings where the utmost accuracy of reproduction is desired, e.g. in monitoring facilities, recording studios etc.

History

The effect of the various speaker parameters, enclosure sizes and port (and duct) dimensions on the performance of bass reflex systems was not well understood until the early 1970s. At that time, pioneering analyses by A.N. Thiele [1] and Richard H. Small [2] related these factors to a series of "alignments" (sets of the relevant speaker parameters) that produced useful, predictable responses. These made it possible for speaker manufacturers to design speakers to match various sizes of enclosures and enclosures to match given speakers with great predictability. All of this is constrained by the laws of physics, which is discussed in detail in Thiele and Small's work. It is not possible to have a small speaker in a small enclosure producing extended bass response at high efficiencies (ie, requiring only a

low-powered amplifier). It's possible to have two of these parameters, but not all. The sound pressure produced is dependent on the efficiency of the speaker, the mechanical or thermal power handling of the driver, the power input and the size of the driver.



Bass reflex tube.

Advantages

This resonant system augments the bass response of the driver, and if designed properly, can extend the frequency response of the driver/enclosure combination to below the range the driver could reproduce in a sealed box. The enclosure resonance has a secondary benefit in that it limits cone movement in a band of frequencies centered around the tuning frequency, reducing distortion in that frequency range.

Limitations

The tradeoff for this augmentation is that at frequencies below 'tuning', the port unloads the cone and allows it to move much as if the speaker were not in an enclosure at all. This means the speaker can be driven past safe limits at frequencies below the tuning frequency with much less power than in an equivalently sized sealed enclosure. For this reason, high powered systems using a bass reflex design are often protected by a filter that removes signals below a certain frequency. One such filter is the rumble filter often built in to receivers or amplifiers designed to be used with LP records because of the undesired LF rumble from the mechanical parts of the turntable. Because of the complex frequency dependent loading, ported enclosures generally result in poorer transient response at low frequencies than in well-designed sealed box systems. The audible effects of this in a properly designed system are debatable. A poorly designed bass reflex system, generally one that is tuned too high, can ring at the tuning frequency and create a 'booming' one-note quality to the bass frequencies.

Ported systems are more complex than sealed box systems, and are more expensive, all other factors being equal.

See also

loudspeaker enclosure

References

1. ^ Thiele, A. N., "Loudspeakers in Vented Boxes: Parts I and II," J. Audio Engineering Soc., Vol 19, No. 5, May 1971, pp 382-392 (Reprinted from a 1961 publication in Proc. IRE Australia).
2. ^ Small, Richard H., "Vented-Box Loudspeaker Systems, Part I: Small-Signal Analysis", J. Audio Engineering Soc., Vol 21, No. 5, June 1973, pp 363-444.